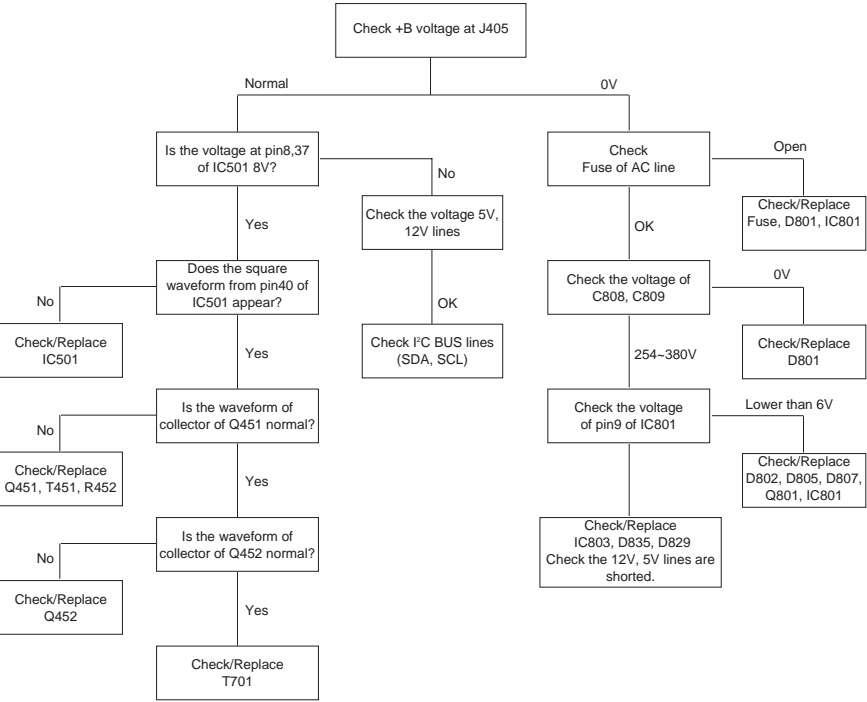
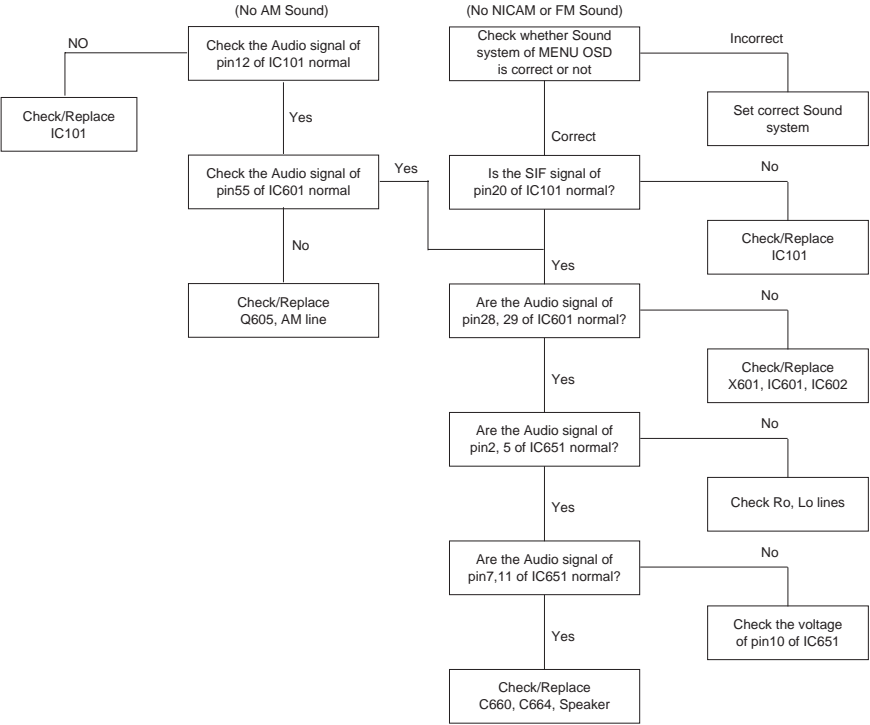


Troubleshooting Guide

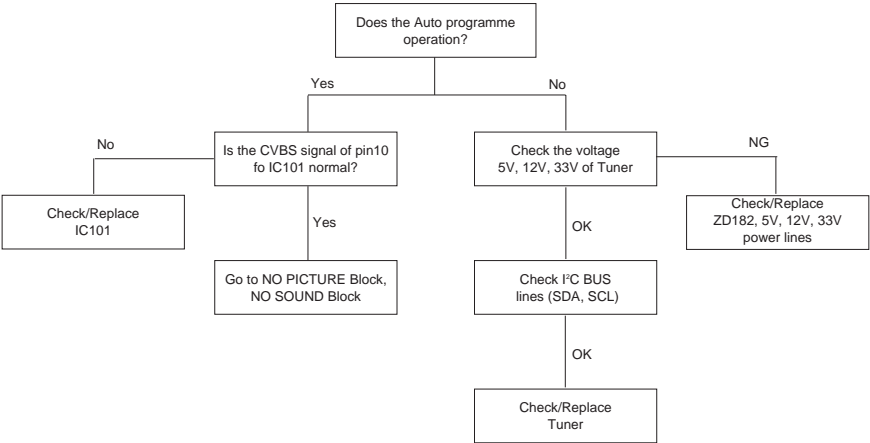
NO RASTER



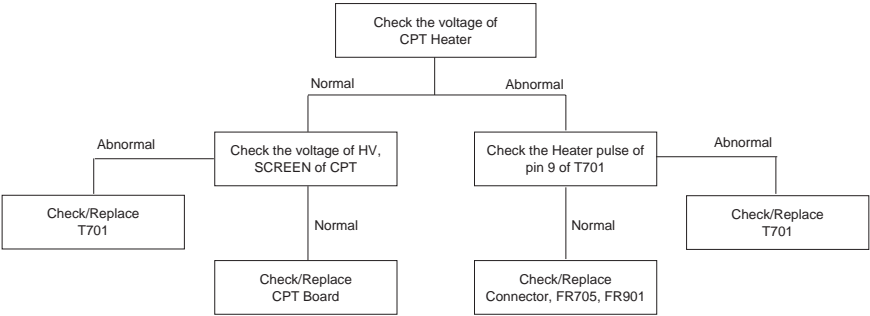
NO SOUND
(PICTURE OK)



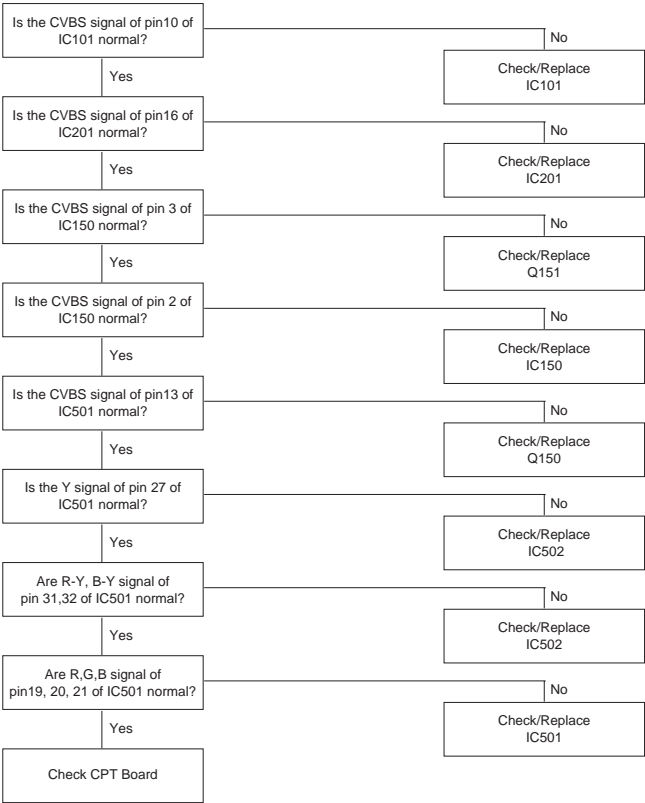
NO PICTURE/NO SOUND
(RASTER OK)



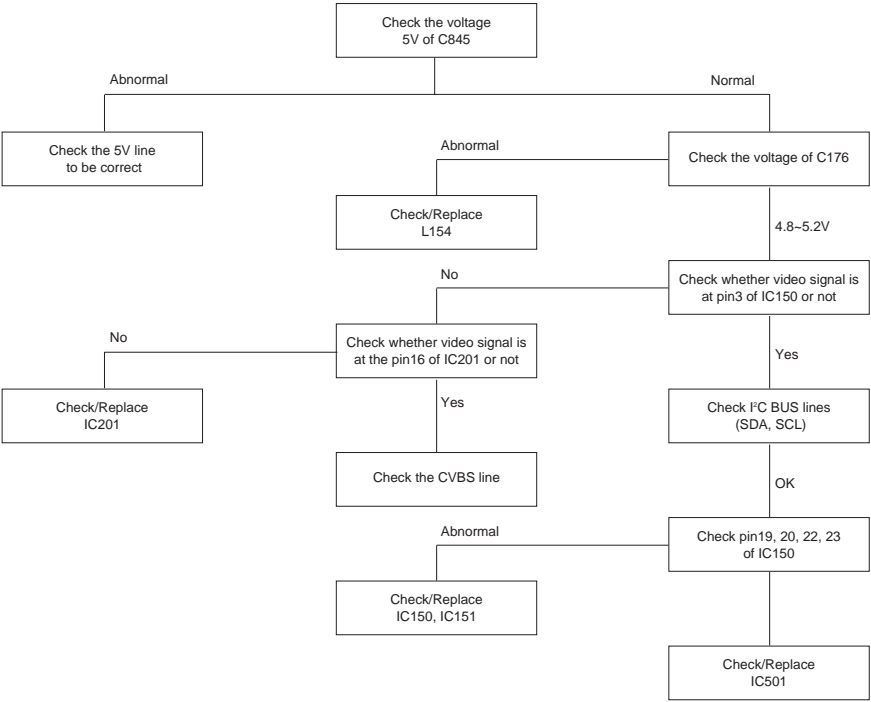
NO RASTER
(SOUND OK)



NO PICTURE/NO COLOR



NO TELETEXT



ADJUSTMENT INSTRUCTIONS

* Safety Precautions

1. It is safe to adjust after using insulating transformer between the power supply line and chassis input to prevent the risk of electric shock and protect the instrument.
2. Never disconnect leads while the TV receiver is on.
3. Don't short any portion of circuits while power is on.
4. The adjustment must be done by the correct appliances. But this is changeable in view of productivity.
5. Unless otherwise noted, set the line voltage to 230Vac \pm 10%, 50Hz.

* Test Equipment required

1. RF signal generator (with pattern generator)
2. DC Power Supply
3. Multimeter (volt meter)
4. Oscilloscope
5. Color analyzer

Main Board(Component side view)

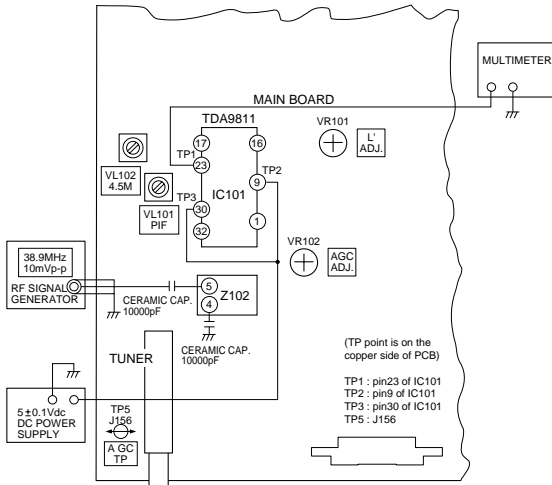


Fig. 1: Connection Diagram of Equipment for PIF Adjustment

* PIF (Picture Intermediate Frequency) Adjustment

Test Point : TP1

Adjust : VL101

1. Connect the measuring equipment to the Main Board as shown in Fig.1.
2. Set RF frequency and output level of RF SIGNAL GENERATOR as shown Table 1.
3. Turn on DC power supply.
4. Adjust VL101 so that the DC voltage may be indicated 2.6 ± 0.1 Vdc.

Frequency	Modulation	Output level
38.9MHz	OFF	10mVp-p

(Table 1)

* SECAM L' Adjustment

NOTE : This adjustment should be performed after PIF adjustment.

Test Point : TP1

Adjust : VR101

1. Tune the TV set to receive a SECAM-L' signal.
2. Adjust VR101 so that the DC voltage may be indicated 2.6 ± 0.1 Vdc.

* SECAM L/L' sound Adjustment

Test Point : C638(Refer to the Fig.2)

Adjust : VL102

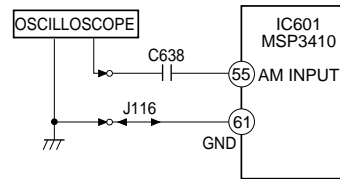
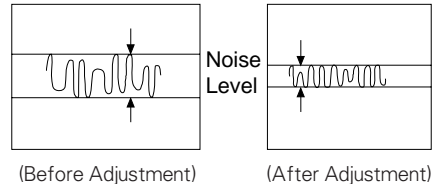


Fig. 2



1. Connect the Oscilloscope to the Main Board as shown in Fig. 2.
2. Set pattern generator as shown Table 2.
3. Adjust VL102 so that the Noise level is minimized.

System	Signal Pattern	Sound signal	Carrier signal
SECAM-L	Color bar	Off	On

(Table 2)

* Vertical/Horizontal/E-W (East-West) Adjustment (LINE SVC 1)

NOTE : These adjustments are already aligned at the time of manufacture for optimum performance. Readjustment of them should not be necessary unless IC02 (EEPROM) is defective. Because all the information of these adjustment are memorized in that IC.

Adjustment Procedures

- 1) Tune the TV set to receive a digital circle pattern unless otherwise noted.
- 2) Press OK button on Control Board continuously and OK button on remote controller then you can find On Screen Display. (Refer to the following Fig.3).
- 3) Press PR+ or PR- button for desirous function adjustment.
- 4) Press VOL+ or VOL- button for correct picture.
- 5) Press OK button to memorize all the adjusted data.
- 6) After finishing adjustment, press TV/AV button on remote controller then TV is changed from SVC mode to normal mode.

[LINE SVC1]				1
				CH5
VL	43	EW	37	
VA	21	EP	39	
SC	35	EC	29	
VS	35	ET	20	
HS	31	50HZ*		

*: This is only displayed according to receiving system.

[PAL/SECAM System : 50Hz
NTSC System : 60Hz

Fig. 3

VL--(Vertical Linearity)

Adjust so that the boundary line between upper and lower half is in accord with geometric horizontal center of the CPT.

VA--(Vertical Amplitude)

Adjust so that the circle of a digital circle pattern may be located within the effective screen of the CPT.

SC--(Vertical "S" correction)

Adjust so that all distance between each horizontal lines are to be the same.

VS--(Vertical Shift)

Adjust so that the horizontal center line of a digital circle pattern is in accord with geometric horizontal center of the CPT.

HS--(Horizontal Shift)

Adjust so that the vertical center line of a digital circle pattern is in accord with geometric vertical center of the CPT

EW--(Horizontal Width)

Adjust to that a digital circle pattern looks like exact circle.

EP--(East-west Parabola)

Adjust so that middle portion of the outermost left and right vertical line looks like parallel with vertical lines of the CPT.

EC--(East-west Corner)

Adjust so that the vertical line at every 4 corners of the screen looks like parallel with the vertical lines of the CPT.

ET--(East-west Trapezium)

Adjust to make the length of top horizontal line same with it of the bottom horizontal line.

* White Balance Adjustment.(LINE SVC 2)

NOTE : This adjustment should be performed after screen voltage adjustment.

- 1) Tune the TV set to receive an 100% white pattern.
- 2) Press Number 2 button on remote controller in the SVC Mode (press OK button on control board continuously and OK button on remote controller) then you can find On Screen Display. (Refer to the following Fig.4).
- 3) Press PSM (RED) button on remote controller. (Standard picture)
- 4) Press PR+ or PR- button for desirous function adjustment.
- 5) Adjust VOL+ or VOL- button for GG31.
- 6) Adjust VOL+ or VOL-button in each status of "RG--"/"BG--" for X=288+_8, Y=295+_8 with color analyzer (color temperature 9000°K).

[LINE SVC2]		1
		CH5
RG31		
GG31		
BG23		
DY12*		

Fig. 4

*: Never change this data, this is an important reference data for TV.

Ref) PAL I/I': DY15

NOTE : If press Number 3 button on the remote controller in the SVC mode then you can find On Screen Display. (Refer to the following Fig.5).

[LINE SVC3]		1
		CH5
FP	30	
NP	110	
SP	23	
SV	75	

Fig. 5

* Never change these data, these are important reference data for TV

* RF AGC (Automatic Gain Control) Adjustment

Test Point : TP5 (J156) or Observing Display

Adjust : VR102

The RF AGC control (VR102) was aligned at the time of manufacture for optimum performance over a wide range conditions. Readjustment of VR102 should not be necessary unless unusual local conditions exist, such as ;

- 1) Channel interference in a CATV system.
- 2) Picture bending and/or color beats, which are unusually due to excessive RF signal input when the receiver is too close to a transmitting tower or when the receiver is connected to an antenna distribution system where the RF signal has been amplified. In this case, the input signal should be attenuated (with pad or filter) to a satisfactory level.
- 3) Picture noise caused by "broadcast noise" or weak signal.
If the broadcast is "clean" and the RF signal is at least 1mV (60dBu), the picture will be noise free in any area.

Adjusting the VR102(RF AGC) control to one end of rotation will usually cause a relatively poor signal to noise ratio;

Adjusting to the other end of rotation will usually cause a degradation of over load capabilities resulting in color beats or adjacent channel interference. For best results, adjust the VR102 control while performing on all over local channels, or the voltage at J156 will be 6.4; 0.1Vdc in RF level 60+_1dBuV.

* Screen Voltage Adjustment

Test Point : RK (Red Cathode of CPT Board)

Adjust : Screen Control of FBT

- 1) Tune the TV set to receive a digital pattern.
- 2) Press PSM (RED) button on remote controller. (standard picture)
- 3) Connect the probe of oscilloscope to the RK (Red Cathode) of CPT Board.
- 4) Adjust Screen Volume of FBT so that the waveform is the same as below Fig. 6.

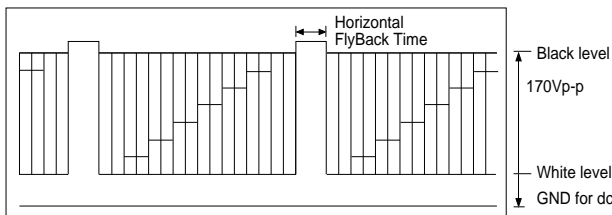


Fig. 6: The waveform of RK(Red Cathode) of CPT Board

* Focus Adjustment

NOTE: This adjustment should be performed after warming up for 10 minutes.

Test Point : Observing Display

Adjust : Focus control of FBT

- 1) Tune the TV set to receive an inactive channel station.
- 2) Adjust the Focus control of FBT for best overall focus.

PURITY & CONVERGENCE ADJUSTMENT

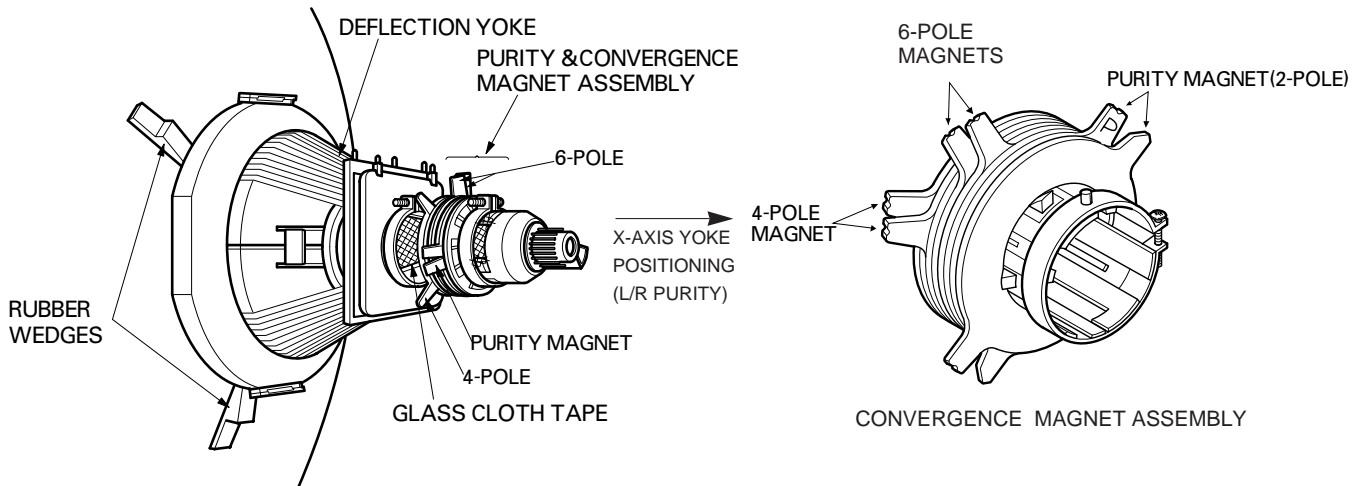
Caution:

Convergence and Purity have been factory aligned. Do not attempt to tamper with these alignments.

However, the effects of adjacent receiver components, or replacement of picture tube or deflection yoke may require the need to readjust purity any convergence.

5. Reconnect the internal degaussing coil.

6. Position the beam bender locking rings at the 9 o'clock position and the other three pairs of tabs (2,4 and 6 pole magnets) at the 12 o'clock position.



* Purity Adjustment

This procedure DOES NOT apply to bonded yoke and picture tube assemblies.

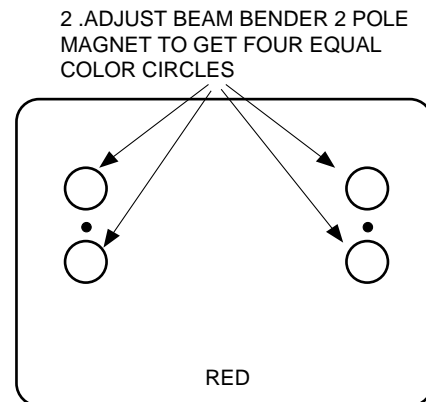
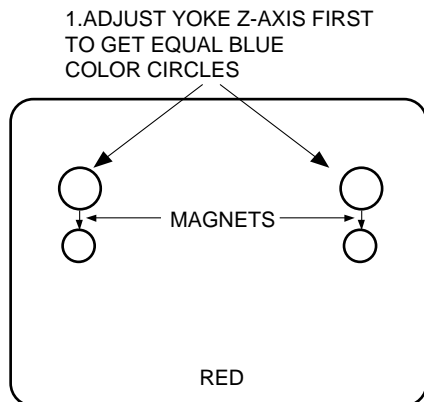
The instrument should be at room temperature (60 degrees F or above) for six (6) hours and be operating at low beam current (dark background) for approximately 20 to 30 minutes before performing purity adjustments.

CAUTION: Do not remove any trim magnets that may be attached to the bell of the picture tube.

1. Remove the AC power and disconnect the internal degaussing coil.
2. Remove the yoke from the neck of the picture tube.
3. If the yoke has the tape version beam bender, remove it and replace it with a adjustable type beam bender (follow the instructions provided with the new beam bender)
4. Replace the yoke on the picture tube neck, temporarily remove the three (3) rubber wedges from the bell of the picture tube and then slide the yoke completely forward.

7. Perform the following steps, in the order given, to prepare the receiver for the purity adjustment procedure.

- a. Face the receiver in the "magnetic north" direction.
- b. Externally degauss the receiver screen with the television power turned off.
- c. Turn the television on for approximately 10 seconds to perform internal degaussing and then turn the TV off.
- d. Unplug the internal degaussing coil. This allows the thermistor to cool down while you are performing the purity adjustment. DO NOT MOVE THE RECEIVER FROM ITS "MAGNETIC NORTH" POSITION.
- e. Turn the receiver on and obtain a red raster by increasing the red bias control (CW) and decreasing the bias controls for the remaining two colors (CCW).
- f. Attach two round magnets on the picture tube screen at 3 o'clock and 9 o'clock positions, approximately one (1) inch from the edge of the mask (use double-sided tape).



8. Referring to above, perform the following two steps:
 - a. Adjust the yoke Z-axis to obtain equal blue circles.
 - b. Adjust the appropriate beam bender tabs to obtain correct purity (four equal circles).
9. After correct purity is set, tighten the yoke clamp screw and remove the two screen magnets.
10. Remove the AC power and rotate the receiver 180 degrees (facing "magnetic south").
11. Reconnect the internal degaussing coil.
12. Turn the receiver on for 10 seconds (make sure the receiver came on) to perform internal degaussing, and then turn the receiver off.
13. Unplug the internal degaussing coil.
14. Turn on the receiver and check the purity by holding one (1) round magnet at the 3 o'clock and a second round magnet at 9 o'clock position. If purity is not satisfactory, repeat steps 8 through 14.
15. Turn off the receiver and reconnect the internal degaussing coil.

* Convergence Adjustment

Caution: This procedure DOES NOT apply to bonded yoke and picture tube assemblies.
Do not use screen magnets during this adjustment procedure. Use of screen magnets will cause an incorrect display.

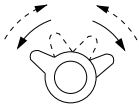
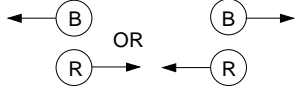

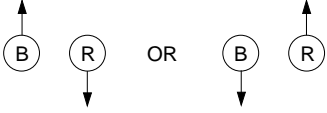

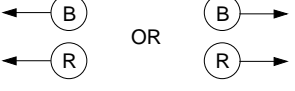

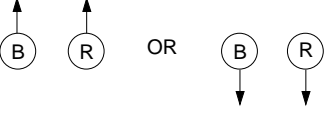
1. Remove AC power and disconnect the internal degaussing coil.
2. Apply AC Power and set the brightness to the Picture Reset condition. Set the Color control to minimum.
3. Apply 8V to the pin.
4. Adjust the Red, Green and Blue Bias controls to get a dim white line.
5. Remove the AC power and 8V from the pin.

6. Reconnect the internal degaussing coil and apply AC power.
7. Turn the receiver on for 10 seconds to perform internal degaussing and then turn the receiver off again.
8. Unplug the internal degaussing-coil.
9. Turn on the receiver, connect a signal generator to the VHF antenna terminal and apply a crosshatch signal.

Caution: During the convergence adjustment procedure, be very careful not to disturb the purity adjustment tabs are accidentally move, purity should be confirmed before proceeding with the convergence adjustments.

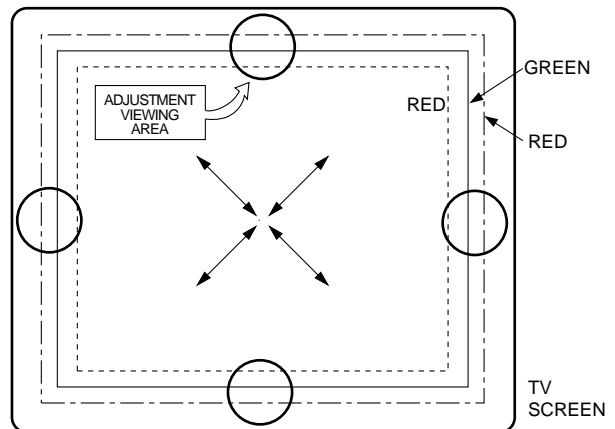
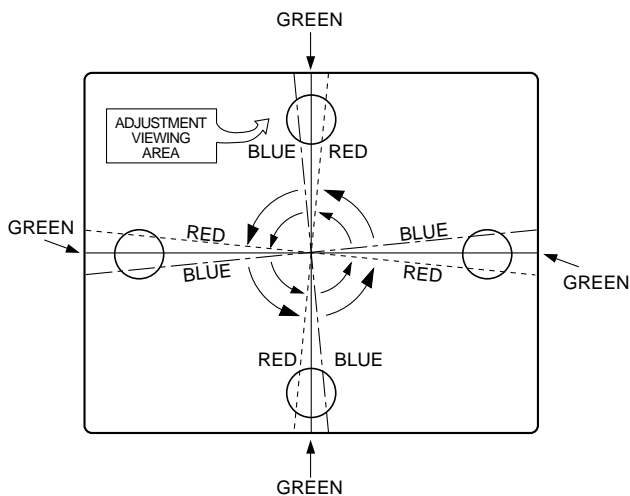
Note: Make sure the focus is set correctly on this instrument before proceeding with the following adjustment.

10. Converge the red and blue vertical lines to the green vertical line at the center of the screen by performing the following steps (below TABLE).
 - a. Carefully rotate both tabs of the 4-pole ring magnet simultaneously in opposite directions from the 12 o'clock position to converge the red and blue vertical lines.
 - b. Carefully rotate both tabs of the 6-pole ring magnet simultaneously in opposite directions from the 12 o'clock position to converge the red and blue (now purple) vertical lines with the green vertical line.
11. Converge the red and blue horizontal with the green line at the center of the screen by performing the following steps. (below TABLE)
 - a. Carefully rotate both tabs of the 4-pole ring magnet simultaneously in the same direction (keep the spacing between the two tabs the same) to converge the red and blue horizontal lines.
 - b. Carefully rotate both tabs of the 6-pole ring magnet simultaneously in same direction (keep the spacing between the two tabs the same) to converge the red and blue (now purple) horizontal lines with the green horizontal line.
 - c. Secure the tabs previously adjusted by locking them in place with the locking tabs on the beam bender.

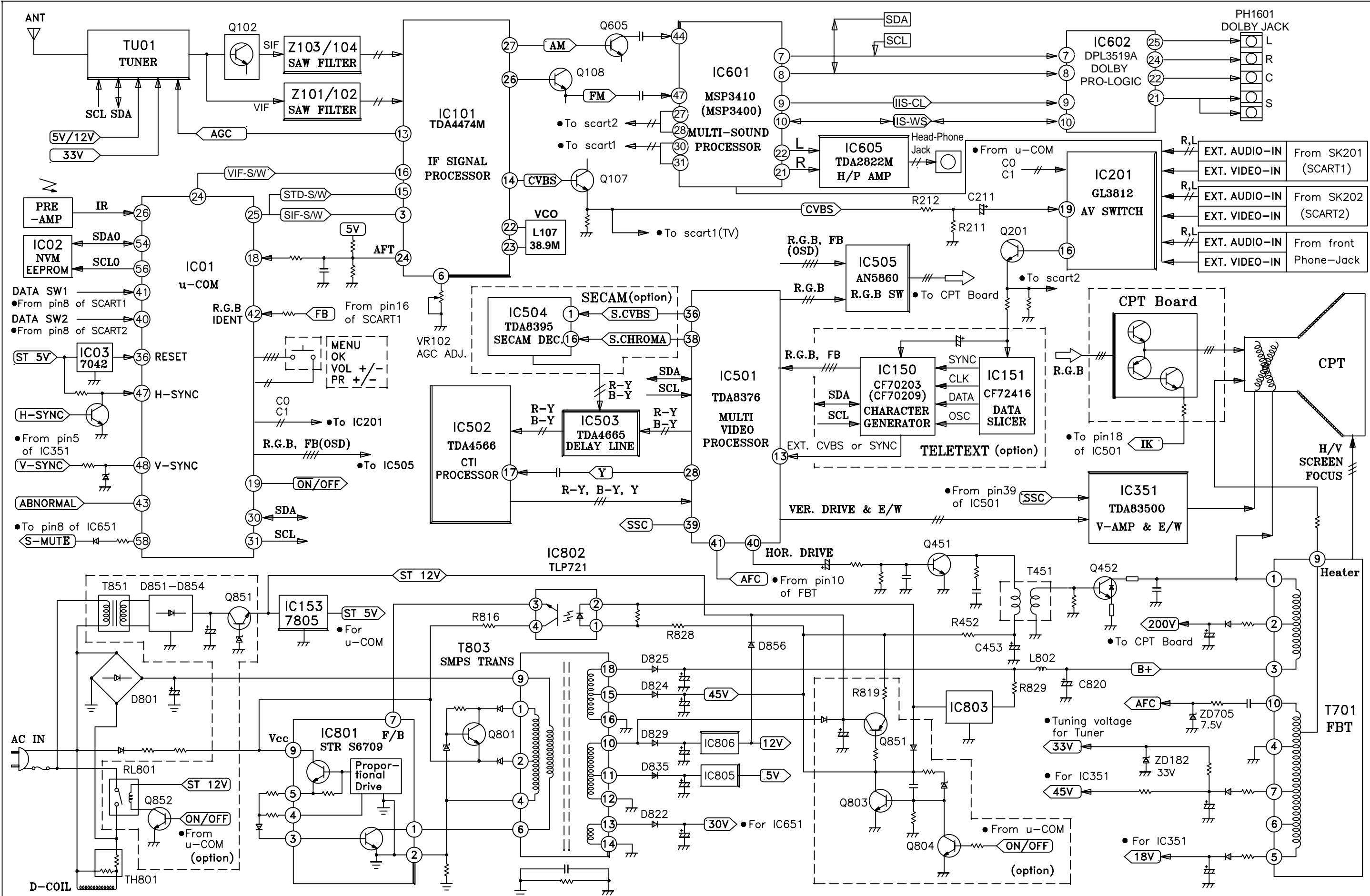
RING PAIRS	ROTATION DIRECTION OF BOTH TABS	MOVEMENT OF RED AND BLUE BEAMS
4 POLE	 OPPOSITE	
	 SAME	
6 POLE	 OPPOSITE	
	 SAME	

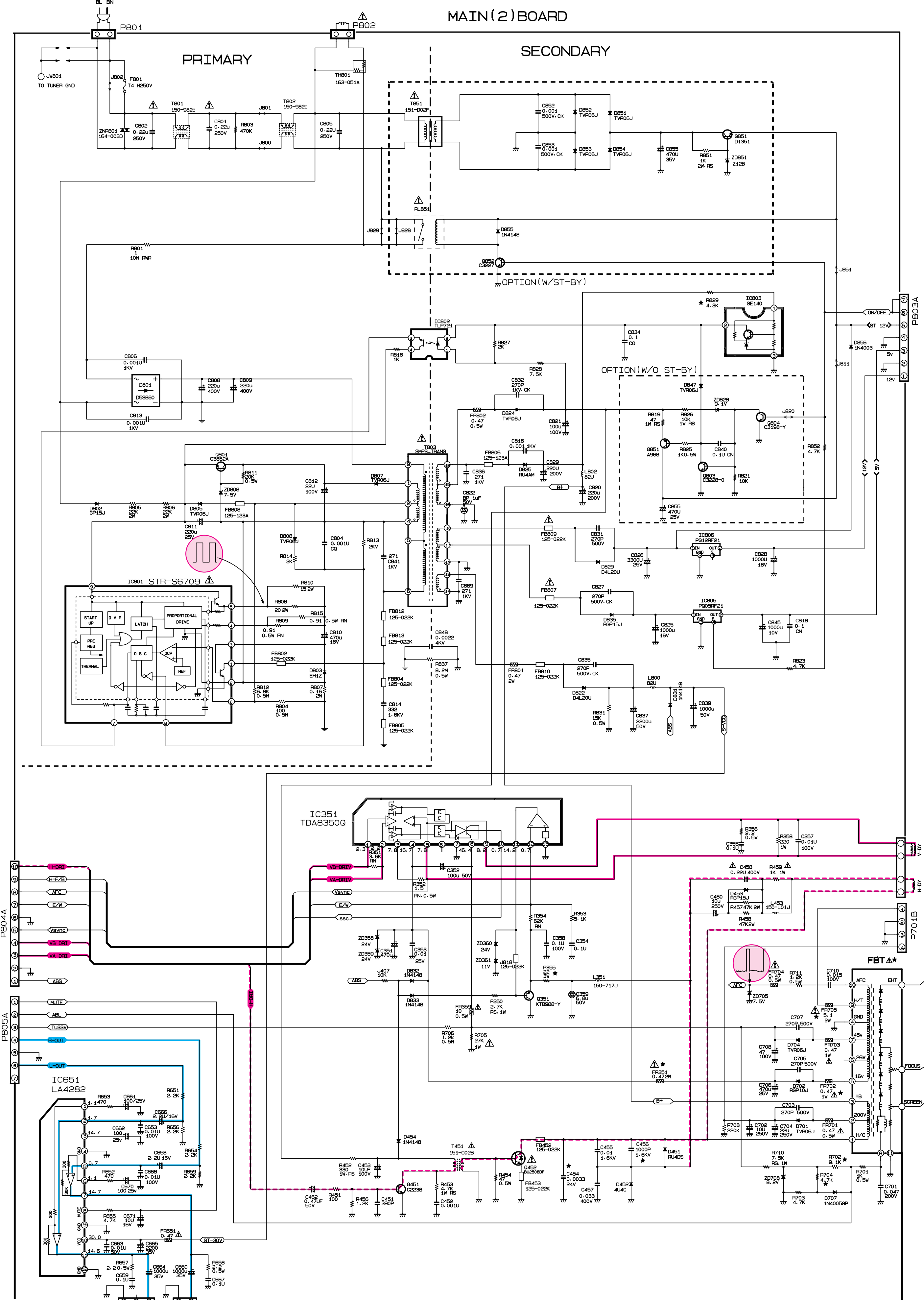
UP/DOWN ROCKING OF THE YOKE
CAUSES OPPOSITE ROTATION OF RED
AND BLUE RASTERS

LEFT/RIGHT ROCKING OF THE YOKE
CAUSES OPPOSITE SIZE CHANGE OF THE
RED AND BLUE RASTERS



- While watching the 6 o'clock positions on the screen, rock the front of the yoke in a vertical (up/down) direction to converge the red and blue vertical lines. (Fig upper left)
- Temporarily place a rubber wedge at the 12 o'clock position to hold the vertical position of the yoke.
- Check the 3 o'clock and 9 o'clock areas to confirm that the red and blue horizontal lines are converged.
If the lines are not converged, slightly offset the vertical tilt of the yoke (move the rubber wedge if necessary) to equally balance the convergence error of the horizontal lines at 3 o'clock and 9 o'clock and the vertical lines at 6 o'clock and 12 o'clock.
- Place a 1.5 inch piece of glass tape over the rubber foot at the rear of the 12 o'clock wedge.
- While watching the 6 o'clock and 12 o'clock areas of the screen, rock the front of the yoke in the horizontal (left to right) motion to converge the red and blue horizontal lines. (Fig. upper right)
- Temporarily place a rubber wedge at the 5 o'clock and 7 o'clock positions to hold the horizontal position of the yoke.
- Check the 3 o'clock and 9 o'clock areas to confirm that the red and blue vertical lines are converged. If the lines are not converged, slightly offset the horizontal tilt of the yoke (move the temporary rubber wedges if necessary) to equally balance the convergence error of the horizontal lines at 6 o'clock and 12 o'clock and the vertical lines at 3 o'clock and 9 o'clock.
- Using a round magnet confirm purity at the center, right and left sides and corners. See Purity Adjustment Procedure.
- Reconfirm convergence and apply a 1.5 inch piece of glass tape over the rubber foot at the rear of the 5 o'clock and the 7 o'clock wedges.

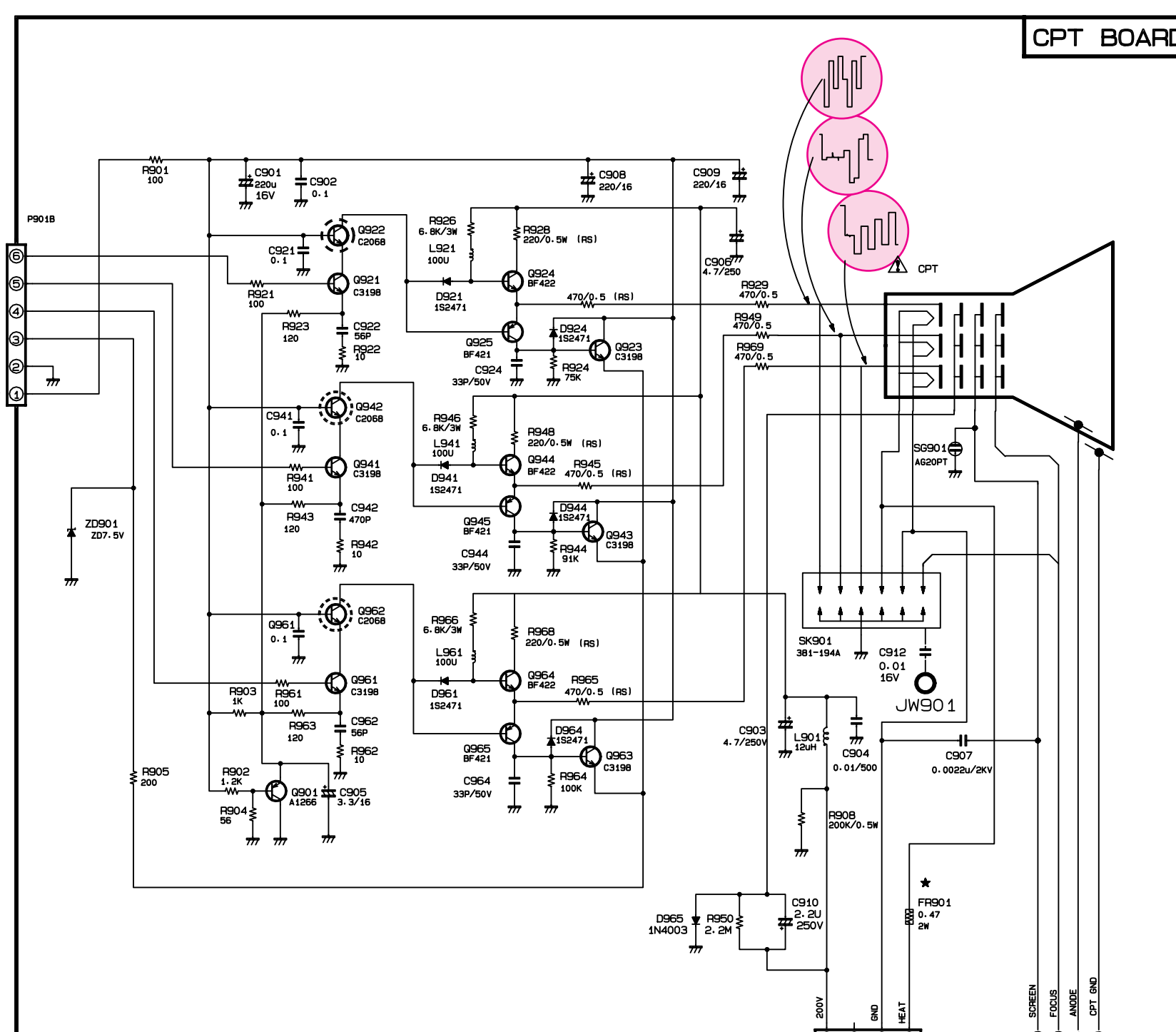
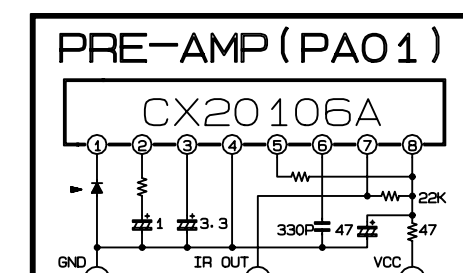




NOTICE

Since this is basic circuit diagram. The value of components and some partial connection are subject to change for improvement without notice.

The components marked Δ conform to VDE or IEC guide-lines and are essential for safe operation of the TV receiver. While those marked Δ are required for correct operation. Use specified parts only when replacing.

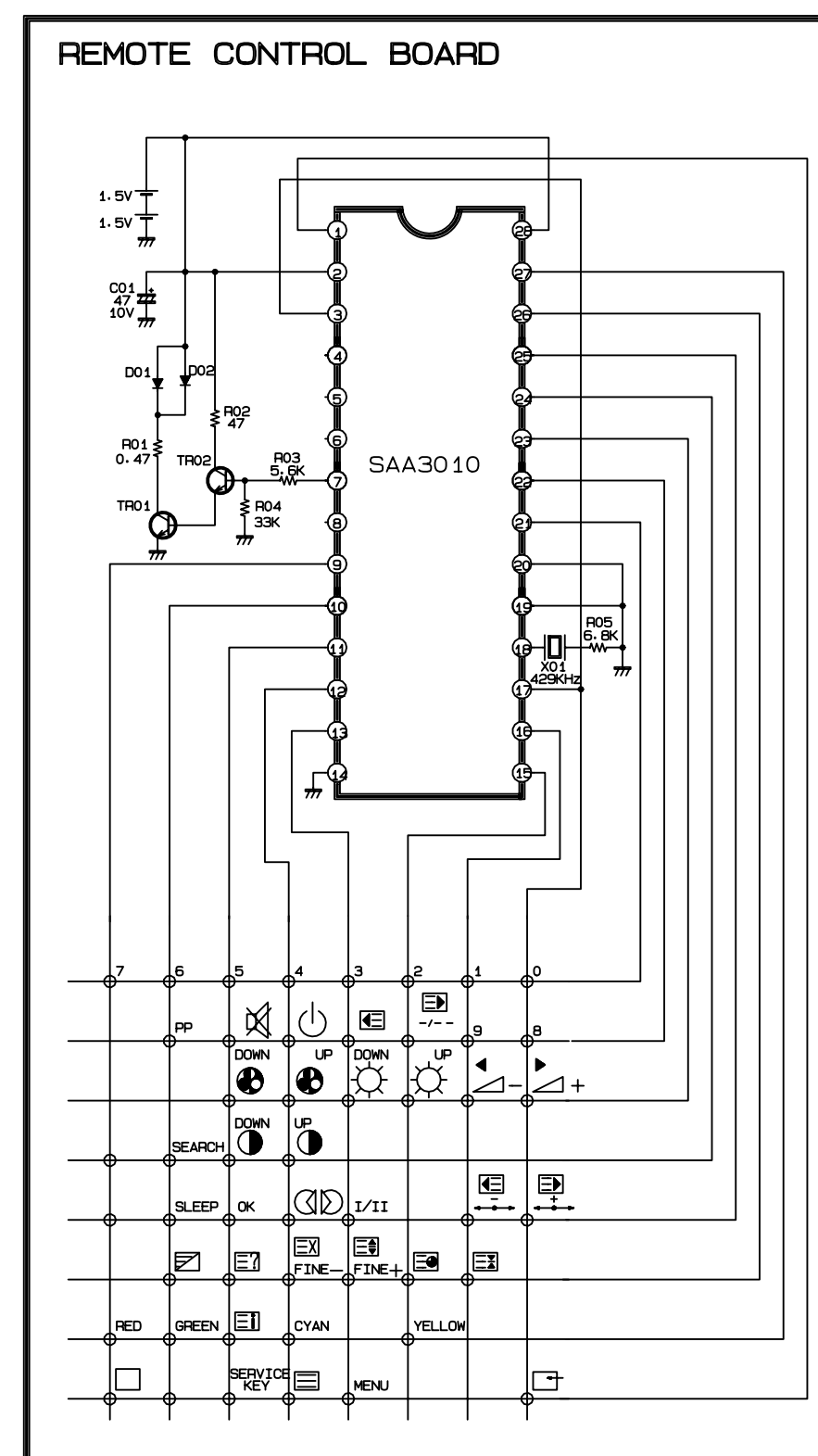


Value of resistor, capacitor and inductor

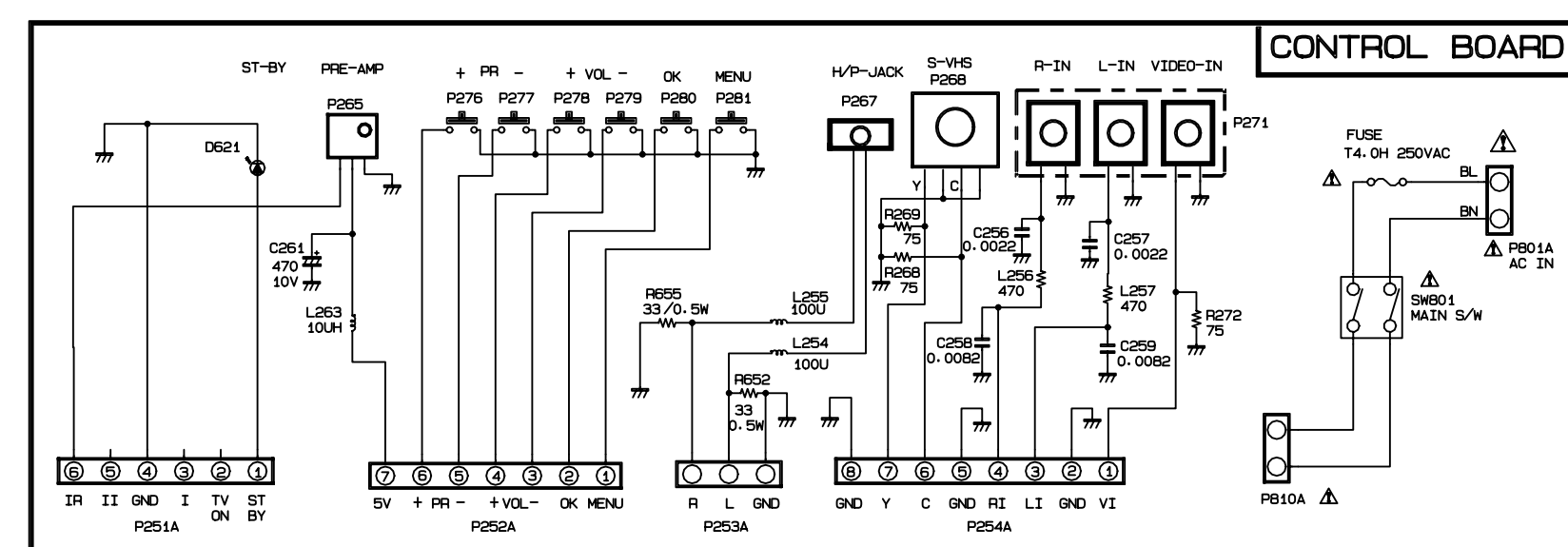
1. Resistances are shown in ohm. K=1,000. M=1,000,000.
2. Unless otherwise noted in schematic. All capacitor values less than 1 are expressed in mfd and the values more than 1 in pF.
3. Unless otherwise noted in schematic. All inductor values more than 1 are expressed in uH and the values less than 1 in Henry(H).

Observation of voltages and waveforms

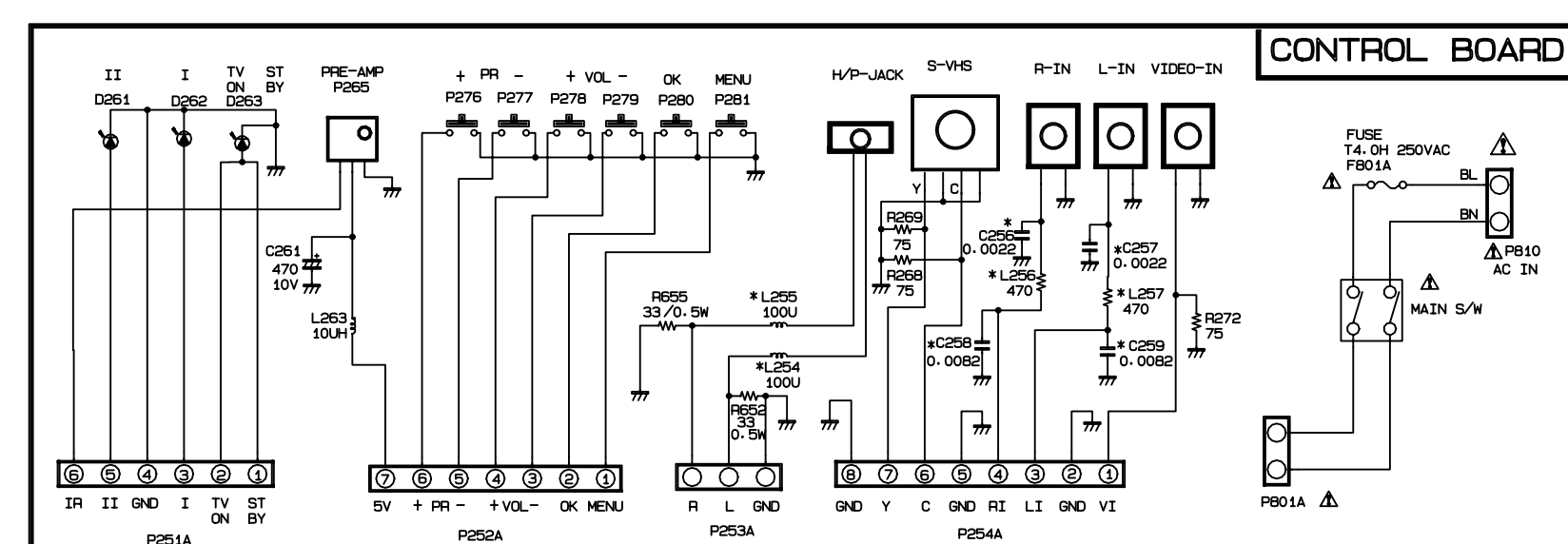
1. Voltages read with VTVM from point to chassis ground. line voltage is 230+/-20% volts. signal pattern is colour-bar.
2. The schematic shown is representative only.
3. All waveforms are taken using a wide band oscilloscope and a low capacity probe.
4. Check FINE TUNING, AGC, CONTRAST, BRIGHTNESS and COLOUR controls for best picture. make sure that COLOUR and BRIGHTNESS are in mid-point and CONTRAST is in 75%.
5. Waveforms are taken using a standard colour signal.



< FOR A50 SERIES >



< FOR C28/A28 SERIES >



P/N: 484-933A-S1(2/2)
971120